I Claim:

1. A static mixer comprising mixing elements for separating the material to be mixed into a plurality of streams, as well as means for the layered junction of the same, including a transversal edge and guide walls that extend at an angle to said transversal edge, as well as guide elements arranged at an angle to the longitudinal axis and provided with openings, wherein said mixing element comprises a transversal edge and a following transversal guide wall and at least two guide walls ending in a separating edge each with lateral end sections and with at least one bottom section disposed between said guide walls, thereby defining at least one opening on one side of said transversal edge and at least two openings on the other side of said transversal edge.

2. A static mixer comprising mixing elements for separating the material to be mixed into a plurality of streams, as well as means for the layered junction of the same, including separating edges and a transversal edge that extends at an angle to said separating edges, as well as deflecting elements arranged at an angle to the longitudinal axis and provided with openings, wherein said mixing element comprises at least two separating edges with following guide walls with lateral end sections and with at least one bottom section disposed between said guide walls, and a transversal edge arranged at one end of a transversal guide wall, thereby defining at least one opening on one side of said transversal edge and at least two openings on the other side of said transversal edge.

3. The mixer of claim 1 or 2, wherein said sections of said guide walls are plane and arranged at a mutual angle.

4. The mixer of claim 1 or 2, wherein the enclosure of said mixer has a round cross-section.

5. The mixer of claim 1 or 2, wherein the enclosure of said mixer has a rectangular cross-section, said at least two separating edges with the following guide walls are arranged perpendicularly to said at least one transversal edge with said transversal guide wall, and said lateral end sections and said bottom section are arranged perpendicularly to said guide walls.

6. The mixer of claim 1 or 2, wherein said guide walls are curved, said at least two guide walls having said separating edges at one end of said mixing element, ending in a transversal edge arranged at the other end of said mixing element.

7. The mixer of claim 6, wherein the enclosure of said mixer is round and said mixing element comprises at least two separating edges and one transversal edge connected by guide walls including two lateral end sections and at least one bottom section, said connecting guide walls forming a curved and continuous transition between said separating edges and said transversal edge.

8. The mixer of claim 1 or 2, wherein the successive mixing elements are each arranged in a position rotated about the longitudinal axis.

9. The mixer of claim 8, wherein said successive mixing elements are each rotated by 180° about the longitudinal axis.

10. A static mixer comprising mixing elements for separating the material to be mixed into a plurality of streams, as well as means for uniting the same in a layered manner, including separating edges and a transversal edge that extends at an angle to said separating edges, as well as deflecting elements arranged at an angle to the longitudinal axis and provided with openings, wherein said mixer comprises mixing groups including mixing elements for said division into a plurality of streams, and wherein at least one re-layering element is disposed between said mixing groups.

11. The mixer of claim 10, wherein said mixer successively comprises a first mixing group including mixing elements, followed by a re-layering element which in turn is followed by a second mixing group, and so on, the entrance edge of said re-layering element extending essentially perpendicularly to the transversal edge of the last mixing element of said mixing group, and said second mixing group being reversed by 180° with respect to the flow direction such that the lateral edge of said mixing element extends essentially perpendicularly to the outlet edge of said mixing helix.

12. The mixer of claim 1, wherein the height of said guide walls is greater than the height of said transversal guide wall.

13. The mixer of claim 2, wherein the height of said transverse guide wall is greater than the height of said guide walls.

14. The mixer of claim 12, wherein the height of the guide walls amounts to 1.1 to 2.0, preferably 1.5 times the height of the transversal guide wall.

15. The mixer of claim 13, wherein the height of the transversal guide wall amounts to 1.1 to 2.0, preferably 1.5 times the height of the guide walls.

16. The mixer of claim 12 or 13, wherein said guide walls are internally and/or externally provided with inclined webs.

17. The mixer of claim 12 or 13, wherein longitudinal webs are arranged between the guide walls of two adjacent mixing elements.

18. The mixer of claim 1 or 2, wherein said bottom sections and said guide walls are provided with dead zone obturations.

19. An application of the mixer of claim 1 in the case where the material first reaches said transversal edge, wherein said mixing element is designed to divide the material stream into at least two streams and to divide said two streams into at least six streams at the exit while two mixed streams are directed to one side of said transversal

wall and one mixed stream to the other side of said transversal wall.

20. An application of the mixer of claim 2 in the case where the material first reaches said separating edges and said guide walls, wherein said mixing element is designed to divide the material stream into at least six streams and to direct a respective part of said streams to one side of said transversal edge and the other part of said streams to the other side of said transversal edge.

- - - - - -